ENERGY STAR® Traffic Signals
Draft Specification
Version 2.0
July 7, 2000

The symbol for energy efficiency.

Below is the *second draft* specification *(Version 2.0)* for ENERGY STAR Traffic Signals. In accordance with the requirements of the ENERGY STAR Program, a product must meet all of the identified criteria if it is to be qualified as ENERGY STAR compliant by its manufacturer.

This traffic signal specification is based on a low energy requirement and acceptance by the Institute for Transportation Engineers (ITE). At this time, only the LED technology meets such requirements and therefore the specification includes terms specific to LED traffic signals. However, EPA is open to any other technology that would meets both the EPA and ITE requirements.

1) Definitions: Below is a brief description of an LED traffic signal and related terms as relevant to the ENERGY STAR Program.

A. Highway Traffic Signal: A power-operated illuminated traffic control device, other than a barricade warning light or a steady illuminated lamp, by which traffic is warned or directed to take some specific action.

B. Modules (referred to as "units" by many specifications, including the Cities of Philadelphia and Anaheim): Standard 8-inch (200 mm) or 12-inch (300 mm) round traffic signal indications. They consist of the light source and the lens (usually a sealed unit) that communicate movement messages (stop, caution or prepare to stop, and go) to drivers through red, yellow, and green colors. Arrow modules in the same colors are used to indicate turning movements. Pedestrian modules are used to convey movement information to pedestrians.

C. Traffic signal head: The combination of the traffic signal housing made of plastic or aluminum, with the modules (red, yellow, and green) installed in it. The head typically contains three modules and the necessary wiring, although it may also include arrow modules.

D. LED lamps or LEDs: The individual light-emitting diodes (LEDs), which can be set on a circuit board in any arrangement.

E. LED traffic signal: The generic term used to describe the combination of signal heads or modules

EPA Comments: Above are brief descriptions of the common components of traffic signals, including LED traffic signals. To achieve the maximum energy savings without compromising product performance, the ENERGY STAR specification will focus on energy consumption and will rely on the Institute of Transportation Engineers (ITE) specification for LED Traffic Signals to ensure that the product meets safety and visibility requirements as well.

By federal statute, the design, placement, operation, and maintenance of all U.S. traffic control devices are required to be in conformance with the Manual of Uniform Traffic Control Devices (MUTCD). Published by the Federal Highway Administration, the MUTCD is the basis for all state and local manuals. In the MUTCD, the ITE specification for traffic signal indications is cited as the standard for optical/visual requirements. Hence, the ITE specification is the national standard.

that use LEDs as the source of light. The combination also incorporates the housing unit at an intersection along with any internal components and support structures.

2) Qualifying Products: For the purposes of this Program, LED traffic signals include the following:

   A. Vehicular Traffic Signals, including LED traffic signals
   B. Pedestrian Signals, including LED pedestrian signals

3) Efficiency Specifications for Qualifying Products: Products listed in Section 2 that meet the specifications outlined in Table 1 below and that meet the minimum performance requirements of the appropriate ITE specification may qualify as ENERGY STAR compliant. The wattage requirements in the table below are to be met by the individual module, not the traffic signal heads as defined in Sections 1(B) and (C). These levels include power demand from the LED power circuit.

Table 1: Draft Criteria for ENERGY STAR®-compliant Traffic Signals (Version 2.0)

Module Type	Maximum Wattage (at 74EC)	Nominal Wattage (at 25EC)
12" Red Ball	17	11
8" Red Ball	13	8
12" Red Arrow	12	9
12" Green Ball	15	15
8" Green Ball	12	12
12" Green Arrow	11	11
Pedestrian Head		
Walking Man	12	9
Orange Hand	12	10

a) Test Criteria: The products must meet the minimum performance requirements of the relevant ITE specification.

EPA Comments: The previous version of this draft specification (Version 1.0) was designed to simply continue the movement of the traffic signal market toward the more efficient LED technology. Based upon conversations with manufacturers, utility representatives, and discussion at a recent ITE Subcommittee meeting, EPA drafted a new ENERGY STAR specification that reflects the top tier of the market for traffic signal efficiency and will be much more useful for product specifiers.

Table 1 was derived from data received from the following manufacturers: Dialight Corporation, Ecolux, Inc., Leotek Electronics USA Corp., Precision Solar Controls, and LumiLeds. These LED traffic signal manufacturers currently cover more than 87% of the market for LED traffic signals. The data in the table is based on the two most efficient designs from the manufacturers that submitted data.

(EPA Comments continued on next page)

EPA Comments (continued): The ENERGY STAR label is meant as a reward for the better, more efficient products. Therefore these wattage limits are goals that not all manufacturers could meet on all of their products. As this is still a draft specification, EPA encourages other manufacturers to submit data for inclusion in this analysis. Based upon any additional data, the wattage numbers could be adjusted upward or downward to accommodate a determined percentage of products that are "most efficient."

This draft specification includes both maximum and nominal wattage values so as to capture the incorporation of temperature compensation circuits in many new design modules. These models now meet the intensity requirements at the maximum temperature without creating excess light output at the nominal temperature. However, the effect of this design is a higher power usage with an increase in temperature. In order to capture this higher power usage, power demand levels at both nominal and higher end temperatures are necessary.

The current draft specification contains wattage values for arrows and pedestrian heads even though the ITE specification for these product have not been finalized. It is expected that at the ITE Subcommittee meeting in August 2000, additional specification language will be proposed so that these products will be included. It is therefore possible that the wattage values listed in this table will have to be adjusted in order to accommodate requirements of the revised ITE specification.

Currently the draft specification does not include amber balls. Although there is an ITE specification for these products, currently no products on the market meet these specifications. Therefore, EPA has no basis of determining the maximum or nominal wattages of amber products that comply with the ITE specification in order to derive a reasonable energy consumption threshold value for the Program. An artificial wattage demand goal could be set for manufacturers to strive for, but these would have no technical foundation. Once amber products that meet the ITE specifications become available, EPA will revisit this specification and determine appropriate energy consumption values.

4) Other Information: The *final* version of the ENERGY STAR Traffic Signal specification will be provided in the standard Memorandum of Understanding (MOU) format (see text box below). In addition to the product specifications, other issues will be addressed such as the following.

- Buyer Information: In keeping with the spirit of the ENERGY STAR Program, the Partner will be expected to ensure that consumers have a quick and easy method of determining which of its products are ENERGY STAR compliant. To achieve this goal, EPA recommends that the Partner place the ENERGY STAR logo on all qualified product models, their packaging, and product-related materials such as brochures, manuals, advertisements, and Web sites. Further, to educate consumers about energy efficiency and its benefits, the Partner will provide one or more of the following: a description of the ENERGY STAR Program, a discussion of the energy-saving characteristics of the product, a description of the environmental benefits that result from the energy saved by the product, and/or a description of the potential energy-bill savings of the product. The Partner may determine the best manner to disseminate this information to customers.

- Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR compliant will be defined as the *effective date* of the MOU. EPA currently suggests an effective date of September 1, 2000, however, this date is still subject to negotiation with industry. Manufacturers that sign an MOU with EPA will have one year from the date of signing to qualify at least one product with the final ENERGY STAR specification for traffic signals.

- Future Specification Revisions: EPA reserves the right to change the MOU requirements should technological and/or market changes affect its usefulness to consumers, industry, or the environment. Revisions to the MOU will be arrived at through industry discussions. Specifically with regard to traffic signals, EPA expects that revisions to this specification will be discussed once the ITE specification is final for arrows and pedestrian heads. In addition, discussion will be necessary once ITE compliant amber balls and arrows are developed and marketed by manufacturers.

- Use of the ENERGY STAR Logo: The ENERGY STAR logo may only be used on products that comply with the final specification. Manufacturers who become Partners in the Program, by signing an MOU, must first determine that their products comply with the final specification before using the logo on their products.

- Other Information Requirements: Manufacturers who become Partners are asked to provide EPA with an annual updated list of ENERGY STAR-qualifying products. This information will be posted on the ENERGY STAR web site and provided to those who request compliant product information for traffic signals. In addition, manufacturers are asked to supply basic annual sales data in the form of total unit shipments and the percentage of total unit shipments that meet the ENERGY STAR criteria. This data will be considered confidential and will be used by EPA only for program evaluation purposes. Any information submitted will be masked so as to protect the confidentiality of the Partner.

EPA Comments: In order to focus EPA/industry discussions on the most crucial elements of the Program (i.e., the definitions and specifications), EPA has provided this brief draft specification as opposed to a complete MOU. However, the draft and final versions of the MOU will have all of the standard sections of an ENERGY STAR MOU, including "Common Agreements and Principles," "Entry Into Force and Duration," "Use of the ENERGY STAR Logo and Name," and "Conflict Resolution." As noted above, the product specification, effective date and the duration of the MOU will be negotiated with industry. As always, EPA welcomes comments or alternative proposals from industry that address these issues. EPA deems industry feedback crucial to the successful development of the ENERGY STAR Program.